

**City of Antioch
Proposition 1E Grant Proposal
Attachment 8**

**Economic Analysis -
Water Supply
Costs and Benefits**



City of Antioch
Proposition 1E Stormwater Flood Management Grant Proposal

ATTACHMENT 8 –
ECONOMIC ANALYSIS
WATER SUPPLY COSTS AND BENEFITS

The *Drainage Area 55- West Antioch Creek Channel Improvement Project* included within this proposal is not a water supply project and therefore does not claim any water supply benefits.

In accordance with the PSP, the following details are provided for the Project when applicable:

- ✓ Narrative description of the projects' economic costs
- ✓ Cost details for the entire project
- ✓ Narrative description of the project's expected water supply benefits including
 - Estimates of without-project conditions
 - Estimates of with-project conditions
 - Description of methods used to estimate without and with-project conditions
 - Distribution of the local, regional, and statewide benefits
 - Identification of beneficiaries
 - When benefits will be received
 - Uncertainty of benefits
 - Description of any adverse effects
- ✓ Narrative discussion that describes, qualifies and supports values entered in the tables
- ✓ Quantified estimates of physical and economic benefits
- ✓ Documentation to support information presented in the project

The following sections present a quantitative and qualitative analysis of project costs and water supply benefits. Tables 11 through 15 have been completed, and are included at the end of this section.

Overview

The City of Antioch is partnering with the Contra Costa County Flood Control District (District) to address chronic flooding of West Antioch Creek through the installation of three 14' by 7' Caltrans Standard Box Culverts spanning 620 feet. These box culverts will increase the storm water capacity of the creek, replacing an inadequate concrete trapezoidal ditch and arch culverts. This installation will provide a 25-year level of flood protection (the maximum achieved without expanding the AT&SF RR crossing) to commercial and multi-family properties adjacent to the channel and within a Disadvantaged Community (DAC) by addressing a gap that currently exists between channel improvements made by the Contra Costa County Flood Control & Water Conservation District in 1993 and the earthen channel on the Antioch Fairgrounds property.

This project will (1) **improve flood protection** for the community, including disadvantaged communities (DACs); (2) **eliminate the significant public health threat** to this Disadvantaged Community (DAC) caused by chronic flooding and exposure to constituents of concern in degraded flood waters; (3) **provide water quality and habitat protection benefits** by reducing flood-related debris and pollutant loading in West Antioch Creek, which flows directly into New York Slough, and (4) **provide recreation benefits**, as flooding in this area often results in the closure of the Contra Costa County Fairgrounds, the Antioch Little League Complex and Prosserville Park.

However, this project does not provide direct water supply benefits.

Table 1. Benefit-Cost Analysis Overview

	Present Value
<u>Costs – Total Capital and O&M</u>	\$4,816,752
<u>Monetizable Benefits</u>	
Flood Control Benefits: Avoided losses in property damages, Avoided clean-up costs, Avoided traffic delays due to key road inundation (FRAM)	\$7,876,005
Total Monetized Benefits	\$7,876,005
<u>Qualitative Benefit or Cost</u>	Qualitative indicator*
Water Quality and Other Benefits	
Improved Public Health Protection	++
Improved Surface Water Quality	++
Avoided Loss of Recreation	++
Reduced Street Maintenance Costs	++
Flood Benefit	
Avoided Emergency Response Costs	++
O&M = Operations and Maintenance	
* Direction and magnitude of effect on net benefits:	
+ = Likely to increase net benefits relative to quantified estimates.	
++ = Likely to increase net benefits significantly.	
– = Likely to decrease benefits.	
– – = Likely to decrease net benefits significantly.	
U = Uncertain, could be + or –.	

Economic Costs

Capital costs for the project amount to \$4,816,752 in present value terms, as shown in **Table 14**. This includes initial spending starting in 2011 and continuing through 2013. The project lifetime is expected to be 50 years, and no annual costs are anticipated once the project is completed, in 2013.

Description of Without-Project Conditions

Without the project, annual flooding events will continue to plague this disadvantaged community. This area currently experiences two to three floods annually, which cause damage to local buildings and infrastructure. Additionally, during the flooding events considerable loss of function occurs. Local businesses are inaccessible, resulting in loss of revenue. The Pittsburg-Antioch Highway, which serves as a major transportation artery to and from Eastern Contra Costa County, is often forced to close during these events.

Considerable emergency response costs are incurred during these relatively frequent events. These costs are related to emergency flood response, security provision and flood clean-up. These floods also result in the loss of the ability to provide the community with essential city services due to impacts to the City's Maintenance and Service Center. The flooding levels and associated damages increase in more severe events, such as a 25-year storm.

Description of Expected Water Supply Benefits (With-Project Conditions)

Not applicable

Uncertainty of Costs and Benefits

Not applicable

Potential Adverse Effects

Adverse effects from this project are expected to be limited to temporary construction impacts.

Documents Supporting Cost and Benefit Analysis

The following references support this cost-benefit analysis:

- Personal communication with Phil Harrington, Director of Capital Improvements/Water Rights, City of Antioch (12/16/2010).
- State of California. *San Francisco Bay Basin Water Quality Control Plan (Basin Plan)*. Oakland, CA: RWQCB, 2007. Web. 24 Dec 2010.

Economic Analysis Tables

As shown in **Table 14**, the present value of project costs is \$4,816,752. Because this project does not contribute water supply benefits, **Tables 15, 16, 17 and 18** are not applicable and have been excluded.

Table 14- Annual Cost of Water Supply Project
(All costs should be in 2009 Dollars)
Project: Drainage Area 55 - West Antioch Creek Channel Improvement Project

	Initial Costs	Operations and Maintenance Costs ⁽¹⁾						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Capital and Other initial Costs from Table 6	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +...+ (f)	Discount Factor	Discounted Costs(g) x (h)
2009							\$0	1.000	\$0
2010							\$0	0.943	\$0
2011	\$282,167						\$282,167	0.890	\$251,128
2012	\$862,000						\$862,000	0.840	\$724,080
2013	\$4,850,433						\$4,850,433	0.792	\$3,841,543
2014								0.747	
2015								0.705	
2016								0.665	
2017								0.627	
2018								0.592	
2019								0.558	
2020								0.527	
2021								0.497	
2022								0.469	
2023								0.442	
...								...	
Project Life								...	
Total Present Value of Discounted Costs (Sum of Column (i))									\$4,816,752
Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries									
Comments: Project implementation is expected to decrease costs associated with maintaining the project area when compared to the without-project condition. As such, administrative, operations and maintenance costs have conservatively been excluded from this analysis. All costs are in 2009 dollars.									

(1) The incremental change in O&M costs attributable to the project.

Table 15: Annual Water Supply Benefit
Drainage Area 55 – West Antioch Creek Channel Improvements Project

NOT APPLICABLE

Table 16: Annual Costs of Avoided Projects
Drainage Area 55 – West Antioch Creek Channel Improvements Project

NOT APPLICABLE

Table 17: Annual Other Water Supply Benefits
Drainage Area 55 – West Antioch Creek Channel Improvements Project

NOT APPLICABLE

Table 18: Total Water Supply Benefits
Drainage Area 55 – West Antioch Creek Channel Improvements Project

NOT APPLICABLE